Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	
Amendment of Part 15 Regarding New	)	
Requirements and Measurement Guidelines	)	ET Docket No. 04-37
For Access Broadband over Power Line Systems	)	
	)	

COMMENTS OF PROGRESS ENERGY, INC.

Introduction

Progress Energy, Inc. ("Progress Energy"), on behalf of its subsidiaries Carolina Power & Light Company d/b/a Progress Energy Carolinas, Inc. and Florida Power Corporation d/b/a Progress Energy Florida, Inc. submits its comments in response to the Federal Communications Commission's ("FCC") Notice of Proposed Rule Making ("NPRM") regarding Amendment of Part 15 Regarding New Requirements and Measurement Guidelines for Access Broadband over Power Line Systems, released February 23, 2004 in the above-referenced docket.[1]

Progress Energy Carolinas, Inc. ("PEC") and Progress Energy Florida, Inc. ("PEF") are engaged in the generation, transmission, distribution and sale of electric power in the states of North Carolina, South Carolina and Florida. PEC and PEF provide bundled retail electric service to more than 2.8 million customers in those jurisdictions and thus are particularly interested in using Broadband over Power Line ("BPL") technology for internal benefits, such as automated meter reading, outage detection and system monitoring, as well as for the potential external benefit of providing broadband services to consumers, especially to rural areas. During the past year, PEC conducted a field trial of the BPL wireless technology developed by Amperion, Inc. ("Amperion"), and is currently implementing Phase 2 to obtain operational experience and to

[1] Broadband over Power Line Systems, 69 Fed. Reg. 12612 (FCC May 23, 2003).

better understand market interest. Based on the operational experience to date, Progress Energy offers comments to specific questions as follows:

Definition of Access BPL

In the FCC's NPRM on BPL, Access BPL is defined as "a carrier current system that provides access to broadband services by transmitting radio frequency ("RF") energy by conduction over the medium voltage power lines owned, operated, or controlled by an electric service provider. The electric power lines may be overhead or underground." We feel this definition as proposed is too broad and could be construed to include power line carrier ("PLC") systems and narrowband Automated Meter Reading ("AMR") systems that operate well below 1 MHz. The proposed definition could also be construed to include in-home or in-building wiring.

To provide specificity, we propose the following revised definition: "A carrier current system that transmits high frequency (>1 MHz) radio frequency energy by conduction over electric power lines owned, operated, or controlled by an electric service provider for the purpose of delivering broadband data services. The electric power lines may be aerial or underground, but do not include power lines within the customer premises or in riser conduit within buildings. Access BPL does not include power line carrier systems, as defined in Section 15.113 of the Commission's rules."

Specifying that Access BPL would only include operations above 1 MHz that deliver broadband data would rule out narrowband systems such as PLC, but as an additional measure, the revised definition would explicitly exclude PLC from the definition of Access BPL. Also, the revised definition would exclude power lines in the customer premises or within buildings from Access BPL. That would avoid conflicts with rules that the FCC may adopt for in-home/in-building BPL.

Proposed Measurement Guidelines

General Measurement Principles

1. Proposed Measurement Principle: Testing shall be performed with the BPL system power settings set at the maximum level used by the Equipment Under Test ("EUT").

Comment: As the proposed measurements are to be performed in-situ, the measurements should be performed with the Access BPL equipment power levels set for normal operations at that site – not at the maximum power levels as proposed in the NPRM. In normal operations it is quite likely that the Access BPL equipment would operate at a power level much less than the maximum it is capable of generating. Therefore, measuring at the maximum power levels would provide an inaccurate reading for the Access BPL equipment operating at that site.

2. Proposed Measurement Principle: Testing shall be performed using the maximum RF injection duty factor (burst rate). Test modes or test software may be used for uplink and downlink transmissions.

Comment: We suggest the testing be performed when transferring data at a sustained rate that would be similar to slightly greater than the expected usage rate at that site. Performing the EUT with the maximum RF duty cycle it is capable of generating may not represent the normal operation of the equipment with a maximum sustained data transfer. We interpreted the intent of this requirement as being to exercise the equipment so that it would exhibit its maximum potential for creating interference – under normal operating conditions. However, there may be a way to cause the equipment to operate in a diagnostic test mode (used for development testing only) so that its maximum RF injection duty factor would far exceed the RF injection duty factor as would be seen in normal operations, even with a maximum sustained data transfer. This could possibly generate far more interference than would ever be seen in normal operations. By using a sustained data transfer to test the Access BPL equipment so that it will exhibit its maximum RF injector duty factor as would be seen in normal operations will allow a

more accurate way of testing the Access BPL equipment.

Access BPL Measurement Principles

3. Proposed Measurement Principle: *In-situ* testing shall be performed on three typical installations for overhead line(s) and three typical installations for underground line(s).

Comment: We request clarification of what should be tested if more that one vendor is used. Which vendor's equipment should be used in testing? Should three tests be conducted for each vendor's equipment? If the number of installations for a particular vendor is three or less, then we propose the testing should be conducted for only those installations.

Test Environment and Radiated Emissions Measurement Principles for *In-Situ* Testing

4. Proposed Measurement Principle: *In-situ* testing shall be performed with the EUT installed in a building on an outside wall on the ground floor or first floor. Testing shall be performed on three typical installations. The three installations shall include a combination of buildings with overhead line(s) and underground line(s). The buildings shall not have aluminum or other metal siding, or shielded wiring (e.g.: wiring installed through conduit, or BX electric cable).

Comment: If there are a total of three or fewer installations that satisfy the requirements in this paragraph, then we propose the requirement should be for testing only those installations.

Emission Limits and Interference

5. We request comment on whether any additional measures are needed to protect particular operations, such as public safety. For example, should we require Access BPL system to coordinate with public safety agencies that use the HF band for state-wide public safety communications?

Comment: We agree with the analysis in the upper section of Paragraph 37 (Page 16) of the NPRM and therefore see no need for additional measures. In general, we believe that the

risk of harmful interference from Access BPL operations is low. We also believe that a properly designed and operated Access BPL system will pose little interference hazard to non-amateur services such as aeronautical, maritime and public safety. Should any potential harmful interference with any state-wide communication system become apparent then it should be handled like any other report of harmful interference.

6. We are proposing to maintain the existing Part 15 radiated emission limits for Access BPL systems and devices. In addition, we are proposing to exempt Access BPL systems from the existing conducted emission limits of Section 15.107(c). We seek comment on these proposals. We further seek comment on whether Access BPL would in some instances operate in the AM broadcast band (from 535 to 1705 kHz), and whether specific conducted requirements are needed in such situations.

Comments: We agree with the recommendations to exempt Access BPL systems from the existing conducted emissions limits of Section 15.107(c). With the equipment that we are aware of, no BPL system provider uses these frequencies and, therefore, we see no need for conducted emission testing at these frequencies. However, we encourage the FCC to revisit raising radiated emission limits soon after the industry has demonstrated that the interference potential of Access BPL is marginal and recognize that any interference to nearby users can be mitigated.

7. We are proposing to require that Access BPL systems and devices incorporate capabilities that would allow the operator to modify system performance to mitigate or avoid harmful interference to radio services. Second, we propose to require that Access BPL devices incorporate a shut-down feature that would deactivate units found to cause harmful interference, and thereby allow speedy implementation of interference mitigation measures. Finally, we propose to subject Access BPL systems to a notification requirement similar to the notification requirements in our rules for power line carrier (PLC) systems.

- In particular, we request comment on whether we should have specific requirements regarding the above mitigation approaches.

Comments: We propose that any shut-down capability be manually controlled. We feel that any automated system could potentially disable a normally operating system inappropriately. Such disruptions could have serious detrimental impacts on utility operations, such as meter reading and outage detection, as well as, unreasonably interfere with broadband users relying upon BPL. In addition, any reported harmful interference complaint should be investigated to determine first, whether or not it is related to the Access BPL system, and whether the interference is truly harmful.

- Should we require that each Access BPL device be capable of operating across a minimum range frequencies and have the capability to remotely exclude a specific percentage of frequencies within this range?

Comments: With the Amperion Access BPL system, the RF Signal center frequency signal can be remotely adjusted within the frequency spectrum. Additionally, the bandwidth of this RF signal can be remotely modified both in width and to introduce notches for certain frequency ranges to avoid interference. Therefore, with the Amperion system we have found that system performance can be adjusted remotely to eliminate any real "harmful interference" at a particular site. In general, we feel that Access BPL systems should be able to select which specific frequencies are used for transmission.

- We also seek comment on the cost and effectiveness of these or alternative approaches.

Comments: Any cost for changing or upgrading the Access BPL equipment capabilities would have to be identified by the equipment manufacturers.

- We seek comment on the appropriate period of time that we should allow for BPL systems to come into compliance with any new requirements that we may adopt pursuant to this rule making proceeding. We further seek comment on whether Access BPL systems currently

deployed should be required to be brought into compliance with the new rules, and if so, what period of time should be afforded for them to come into compliance.

Comments: Once a system has been installed and is operating within the limits and requirements in place when it was installed, that system should be allowed to remain in operation as long as it remains in compliance with the original requirements in place when it was first installed.

- We also request comment and suggestions on the appropriate industry-operated entity that we should select to receive the notifications and maintain the Access BPL data base. We also seek comment on other approaches for making this information available. For example, would it more reasonable to allow each Access BPL operator to maintain a database of its own rather than require a more centralized data base? Commenting parties are requested to submit information on the benefits of such approaches.

Comments: Progress Energy believes that a centralized database (accessible by the public and/or our competitors) is not necessary and not appropriate. The unintended effects of establishing a centralized database would be to allow access to proprietary information by entities that either do not need it, would want it for competitive reasons, or to facilitate specious harmful interference complaints. We are not aware of any other requirements to publish information about other unlicensed radiation sources that conform to FCC Part 15 Rules. Why should BPL be any different? We feel that each Access BPL operator should maintain a database of its own Access BPL system. The information contained in this database should be based upon zip codes, which is consistent with existing reporting requirements for broadband providers. This database should remain private and should not be centralized or maintained by an industry-operated entity. This database should not be shared or made public as it will contain proprietary information that could and would likely cause harm to the business operations of the operating entity by allowing inappropriate information to become available to their competitors. Any

reported interference complaints should be reported to the operating entity. The operating entity would then be able to utilize this internal database to evaluate the likelihood of the reported interference being related to any Access BPL system and take appropriate actions as necessary.

- We further seek input on any resulting burdens that the proposed notification requirement may place on entities operating Access BPL systems, and any impact of a notification system on the availability of customer data as well as how any concerns regarding the proprietary nature of that data can be addressed.

Comments: Again, any database of the Access BPL systems should be established and maintained by the operating entity and it should not be made public. Any issue of reported harmful interference could be addressed by the operating entity by accessing this database to verify the likelihood of the interference being produced by the Access BPL systems. If it is suspected that an Access BPL system may be a cause of this reported harmful interference then the operating entity could investigate this further and develop remedies as required.

Harmful Interference

As Progress Energy continues Phase 2 of its BPL pilot, we have received several complaints of alleged "harmful interference" from amateur radio operators ('hams"). The term "harmful interference" is defined in the FCC's rules as interference that seriously degrades or repeatedly interrupts another user's transmission. With regard to the hams, it appears that they consider any interference to be harmful. It also appears that those that have submitted complaints about Progress Energy's BPL system intentionally seek out interference using very sophisticated and sensitive equipment. This leads to four factors Progress Energy believes the FCC should consider when addressing the issue of "harmful interference". First, the interference should have to occur in the normal course of the complainant's operations, rather than be the result of the complainant seeking out the interference. Secondly, the interference should have to be more than momentary. That is, for example, if driving another 30 yards will virtually

eliminate the interference, then it is not harmful. Thirdly, the interference should have to be proven to so greatly interfere with operations such that communications are practically unintelligible. Finally, the sensitivity of the measuring equipment must be standardized.

Results of Progress Energy Radiated Emissions Testing

As a part of Progress Energy's Phase 2 trial of the BPL wireless technology, a review of the radiated emissions specifically caused by Amperion BPL equipment installed on the Progress Energy electric system in Raleigh, NC was conducted. These tests were intended to verify the compliance of Amperion MV 1000 Griffin and Lynx products with FCC Part 15 Rules. No emissions were detected that were in excess of the limits for intentional radiators specified in FCC Part 15, Section 15.209. A copy of the full report is attached as a part of these comments.

Summary

Progress Energy fully supports the Federal Communications Commission's efforts to explore how it can promote the development of BPL while continuing to protect other licensed users of the radio bands in which BPL systems typically operate. Progress Energy recognizes that there are key regulatory issues to be addressed, including vendor compliance with the FCC's radio frequency emissions standards. However, we believe these issues can be resolved to the benefit of all involved.

Respectfully submitted,

_____/s/_____

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May 3, 2004

Counsel for Progress Energy

Amperion
POWER IS BROADBAND

Document : Test Report
Revision : A
Author : G Durling

Test Report

Progress Energy Radiated Emissions Testing

Modification History

Rev	Date	Originator	Comment
A	1/22/2004	G Durling	Released to Progress Telecom

Table of Contents

1 Introduction

1.1 Purpose

On January 14th and 15th, 2004, a review of the radiated emissions specifically caused by Amperion BPL equipment Installed in Raleigh NC was conducted.
These tests were intended to verify the compliance of Amperion MV 1000 Griffin and Lynx products with FCC Part 15 Rules.

1.2 Results Summary

No emissions were detected that were in excess of Part 15 limits. For the frequency range from 2.5 MHz to 30.0 MHz, the limits for intentional radiators specified in FCC Part 15, section 15.209.

2 Test Description

2.1 Device Under Test

Amperion MV 1000 Griffin Injector, Part # 890-0040-01
Amperion MV 1000 Griffin Extractor, Part # 890-0040-02
Amperion 25 KV insulated Coupler, Part # 890-0044-01
Amperion MV 1000 Lynx Injector, Part # 890-0007-01
Amperion MV 1000 Lynx Extractor, Part # 890-0007-02
Amperion 3 Inch Underground Coupler, Part # 890-0011-00

2.2 Test Setup

2.2.1 Equipment Needed

Spectrum Analyzer, Rhode & Schwarz FSH3, S/N 101121
Powered magnetic loop antenna A-H Systems SAS-563B, S/N 327
Biconical antenna A-H Systems SAS-542, S/N 776
10 Meter RG-214 Cable, A-H Systems SAC-211-10

Kalibrierschein
Calibration Certificate

Nummer 1330101121
Number

Gegenstand *Item*	Handheld Spectrum Analyzer with Tracking Generator
Hersteller *Manufacturer*	ROHDE & SCHWARZ
Typ *Type*	FSH3
Sach-Nr. *Stock No.*	1145.5850.13
Serien-Nr. *Serial No.*	101121
Auftraggeber *Customer*	
Bestellung Nr. *Order No.*	
Ort u. Datum d. Kalibrierung *Place and date of calibration*	PEMSTAR Almelo, 2003-04-15
Umfang der Kalibrierung *Scope of calibration*	Standard-Calibration
Eingangsprüfung *Performance on receipt*	
Kalibrierergebnis *Result of calibration*	Measurement Results in Specifications
Umfang des Kalibrierscheins *Extent of the certificate*	2 Pages

Dieser Kalibrierschein dokumentiert, daß der ge-nannte Gegenstand nach festgelegten Vorgaben geprüft und gemessen wurde. Die Meßwerte lagen im Regelfall mit einer Wahrscheinlichkeit von annähernd 95% im zugeordneten Werteintervall (Erweiterte Meßunsicherheit mit k = 2).

Die Kalibrierung erfolgte mit Meßmitteln und Normalen, die direkt oder indirekt durch Ableitung mittels anerkannter Kalibriertechniken rückgeführt sind auf Normale der PTB/DKD oder anderer nationaler/internationaler Standards zur Darstellung der physikalischen Einheiten in Übereinstimmung mit dem Internationalen Einheitensystem (SI). Wenn keine Normale existieren, erfolgt die Rückführung auf Bezugsnormale der PEMSTAR Laboratorien.

Grundsätze und Verfahren der Kalibrierung entsprechen ISO / IEC 17025. Das Bestätigungssystem für die verwendeten Meßmittel entspricht DIN ISO 10012-1. Das angewandte Qualitätsmanagement-System ist zertifiziert nach DIN EN ISO 9001.

Dieser Kalibrierschein darf nur vollständig und unverändert weiterverbreitet werden. Kalibrierscheine ohne Signifizierungen sind ungültig.

Für die Einhaltung einer angemessenen Frist zur Wiederholung der Kalibrierung ist der Benutzer verantwortlich.

This calibration certificate documents, that the named item is tested and measured against defined specifications. Measurement results are located usually in the corresponding interval with a probability of approx. 95% (coverage factor k=2).

Calibration is performed with test equipment and standards directly or indirectly traceable by means of approved calibration techniques to the PTB/DKD or other national/international standards, which realize the physical units of measurement according to the International System of Units (SI). In all cases where no national standards are available, measurements are referenced to standards of the PEMSTAR laboratories.

Principles and methods of calibration correspond with ISO / IEC 17025. The metrological confirmation system for the measuring equipment used is in compliance with DIN ISO 10012-1.

The applied quality system is certified to DIN EN ISO 9001.

This calibration certificate may not be reproduced other than in full. Calibration certificates without signatures are not valid.

The user is obliged to have the object recalibrated at appropriate intervals.

Ausstellungsdatum *Date of issue*	**Laborleitung** *Head of laboratory*	**Bearbeiter** *Person responsible*
2003-04-15	Ton van Hemmen	Johan Kortink

A.H. Systems Inc.
9710 Cozycroft Ave. Chatsworth, CA 91311
Phone (818) 998-0223 Fax (818) 998-6892
E-mail: Info@A.H.Systems.com
Web site: http://www.AHSystems.com

Certificate Number: 4852RB

Certificate of Calibration

The Antenna(s) has been individually calibrated using the following standard procedure(s):
IEEE 291, IEEE 302, SAE-ARP-958D and /or ANSI-C63.5-1998

Calibration Traceability: All measurement instrumentation traceable to the National Institute of Standards and Technology (NIST)
Our "Calibration Measurement Procedures" are in complete compliance with MIL-STD-45662A/ANSI Z540

NIST Numbers: DCV 811/24944-92, ACV 521/234615, Ω 811/250891
Dimensional 821/253616-94, WWW Boulder, CO

Calibration Uncertainty: +/- 1 dB

Environment: Temperature: 76 Degrees Fahrenheit
Humidity: 29% (non-condensing)

Manufacturer	Model Number	Serial Number	Date of Calibration
A.H. Systems Inc.	SAS-563B	327	07-Aug-03

Re-certification Date: 1 year from calibration date

Calibration equipment used

Model Number	Serial Number	Calibration Due Date		Model Number	Serial Number	Calibration Due Date
HP-8563E	3551A04250	12-Feb-04	☐	HP-85620A	01282	14-Feb-04
HP-85644A	3407A00209	12-Feb-04	☑	HP-3325A	1625A00598	8-May-04
HP-8673D	2747A00701	14-Feb-04	☐	HP-8620C	1604A00368	8-May-04

Antenna Condition

Pre Calibration:
In tolerance [ ]
Out of tolerance [ ]
Repair required [ ]
Repair performed [ ]

Post Calibration:
Meets all specs [✓]
Limited specs [ ]
Other [ ]

Special Limitations:

Manny Monzon
RF Technician

Travis P. Samuels
Quality Control Manager

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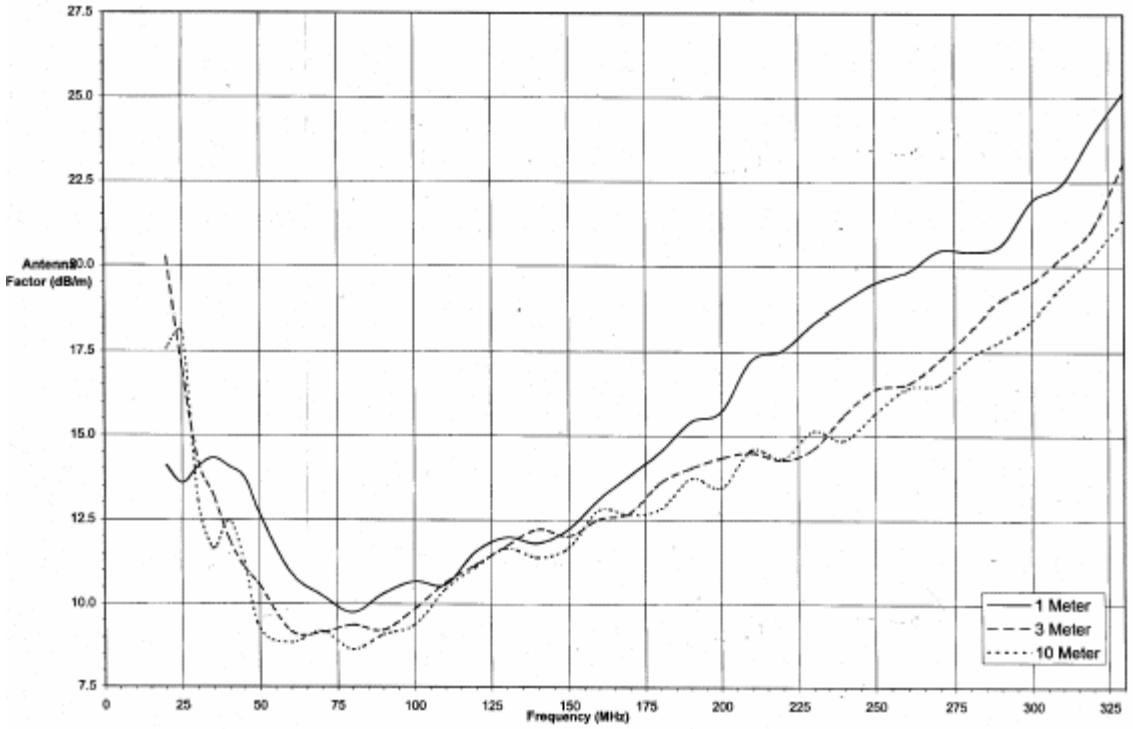
E-mail: Info@AHSystems.com
Web site: http://www.AHSystems.com

Antenna Factor
Biconical, Folding
Model: SAS-542 SN: 776

Conversion of meter reading
to field strength:
dBuV/m = dBuV + AF + cable loss



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E-mail: Info@A.H.Systems.com
Web site: http://www.AHSystems.com

Certificate Number: 4852EA

Certificate of Calibration

The Antenna(s) has been individually calibrated using the following standard procedure(s): ARP-958 and/or IEEE 291 and/or ANSI C63.5

Calibration Traceability: All measurement instrumentation traceable to the National Institute of Standards and Technology (NIST)
Our "Calibration Measurement Procedures" are in complete compliance with MIL-STD-45662A/ANSI Z540

NIST Numbers: DCV 811/24944-92, ACV 521/234615, Ω 811/250891
Dimensional 821/253616-94, WWW Boulder, CO

Calibration Uncertainty: +/- 1 dB

Environment: Temperature: 76 Degrees Fahrenheit
Humidity: 29% (non-condensing)

Manufacturer	Model Number	Serial Number	Date of Calibration
A.H. Systems, inc.	SAS-510-4	128	07-Aug-03
A.H. Systems Inc.	SAS-542	776	07-Aug-03

Re-certification Date: 1 year from calibration date

Calibration equipment used

	Model Number	Serial Number	Calibration Due Date		Model Number	Serial Number	Calibration Due Date
☑	HP-8563E	3551A04250	12-Feb-04	☐	HP-85620A	01282	14-Feb-04
☑	HP-85644A	3407A00209	12-Feb-04	☐	HP-3325A	1625A00598	8-May-04
☐	HP-8673D	2747A00701	14-Feb-04	☐	HP-8620C	1604A00368	8-May-04

Antenna Condition

Pre Calibration:
In tolerance [ ]
Out of tolerance [ ]
Repair required [ ]
Repair performed [ ]

Post Calibration:
Meets all specs [✓]
Limited specs [ ]
Other [ ]

Special Limitations:

Manny Monzon
RF Technician

Travis P. Samuels
Quality Control Manager

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E-mail: Info@AHSystems.com
Web site: http://www.AHSystems.com

Calibration, Active 12" Loop, Battery Powered

Model: SAS-563B Serial Number: 327 Date: 07-Aug-03

Frequency	Antenna Factor (dB/m)
1 KHz	101.6
2 KHz	93.8
5 KHz	84.9
10 KHz	78.7
20 KHz	73.3
50 KHz	66.3
100 KHz	60.0
200 KHz	54.6
500 KHz	46.4
1 MHz	40.7
2 MHz	33.5
5 MHz	26.2
10 MHz	4.0
13 MHz res	-15.9
15 MHz	9.9
20 MHz	12.4
25 MHz	19.5
30 MHz	22.5

Conversion Formulas: dBuV/m = dBuV + AF
dBuA/m = dBuV/m - 51.5 dB

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Web site: http://www.AHSystems.com

Calibration, 10 Meter RG-214 N-N cable

Model: SAC-211-10 Serial Number: -- Date: 28-Aug-0

Frequency (MHz)	Cable Loss (dB)
10	0.3
20	0.4
30	0.4
40	0.5
50	0.5
60	0.6
70	0.7
80	0.7
90	0.8
100	0.9
200	1.3
500	1.8
700	2.0
1000	2.5
1300	2.9
1500	3.2
1700	3.5
1800	3.7
2000	4.0
3000	5.3
4000	6.4
5000	7.5
6000	8.7
7000	9.5
8000	11.0
9000	11.7
10000	13.5

Typical overhead test set-up (Woodchase) ;


SPEED
LIMIT
35

Typical underground test set-up (Whitehurst)

2.2.2 Cautions

No MV wiring areas were accessed during this testing.

2.3 Assumptions

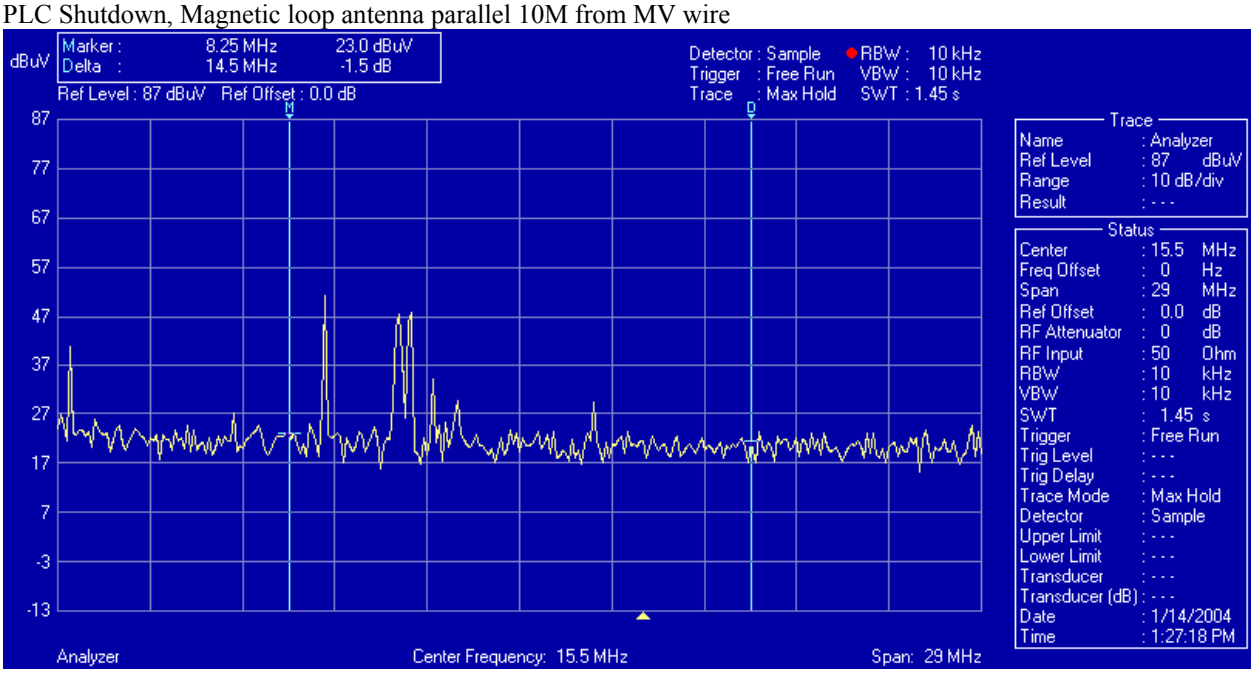
Only BPL specific frequencies were tested. Previous OATS and field test have indicated Amperion MV1000 product complies with part 15 Class B radiated emissions limits above 30 MHz.

3 Test Data

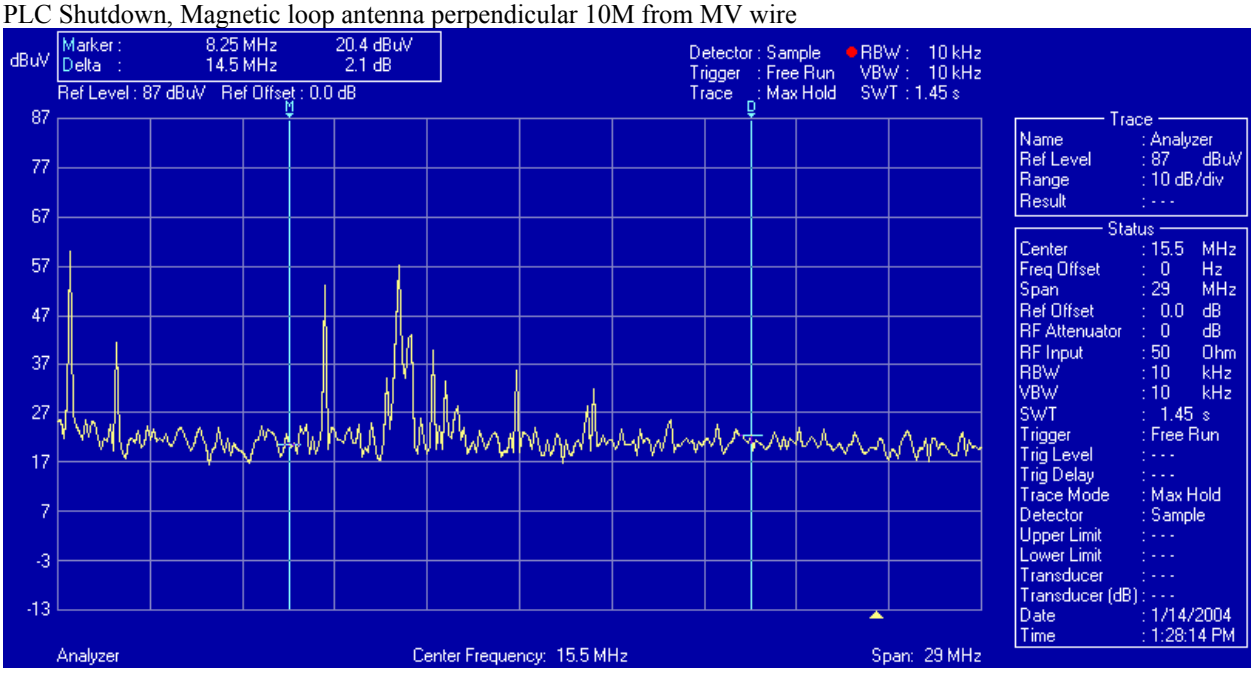
3.1 Woodchase Overhead Deployment

At Injector, Upstream (US) center frequency 28.8 MHz, Downstream (DS) center frequency 23.8 MHz

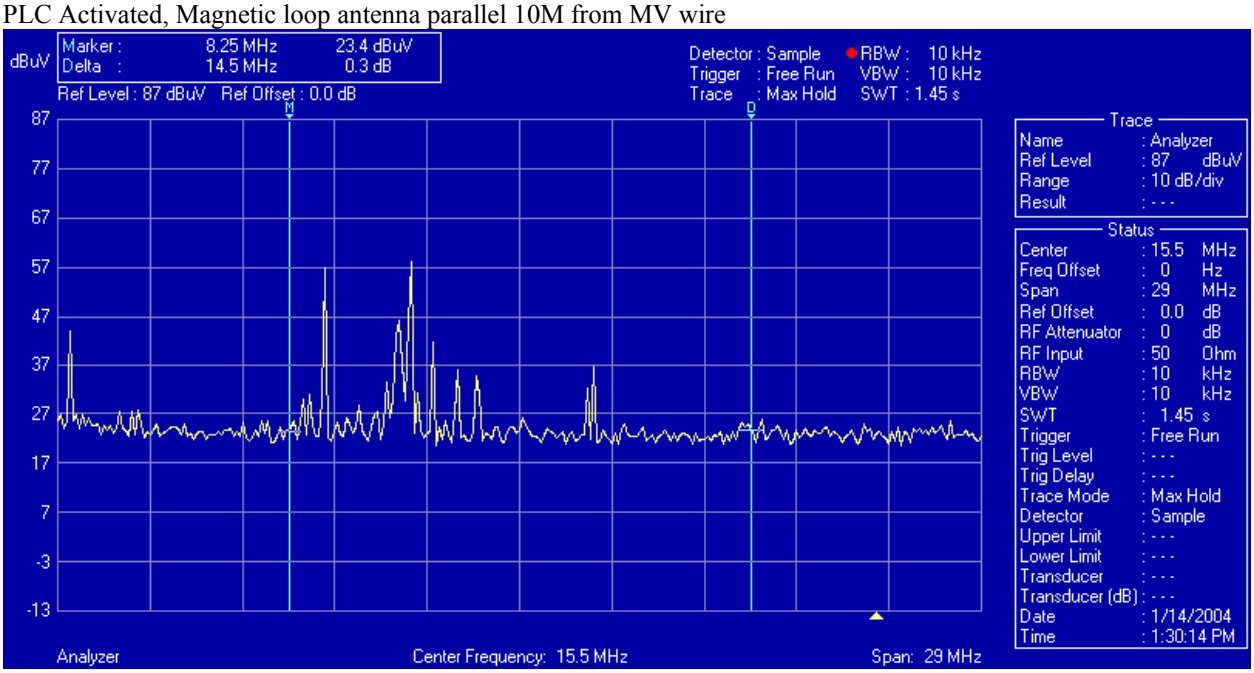
PLC Shutdown, Magnetic loop antenna parallel 10M from MV wire



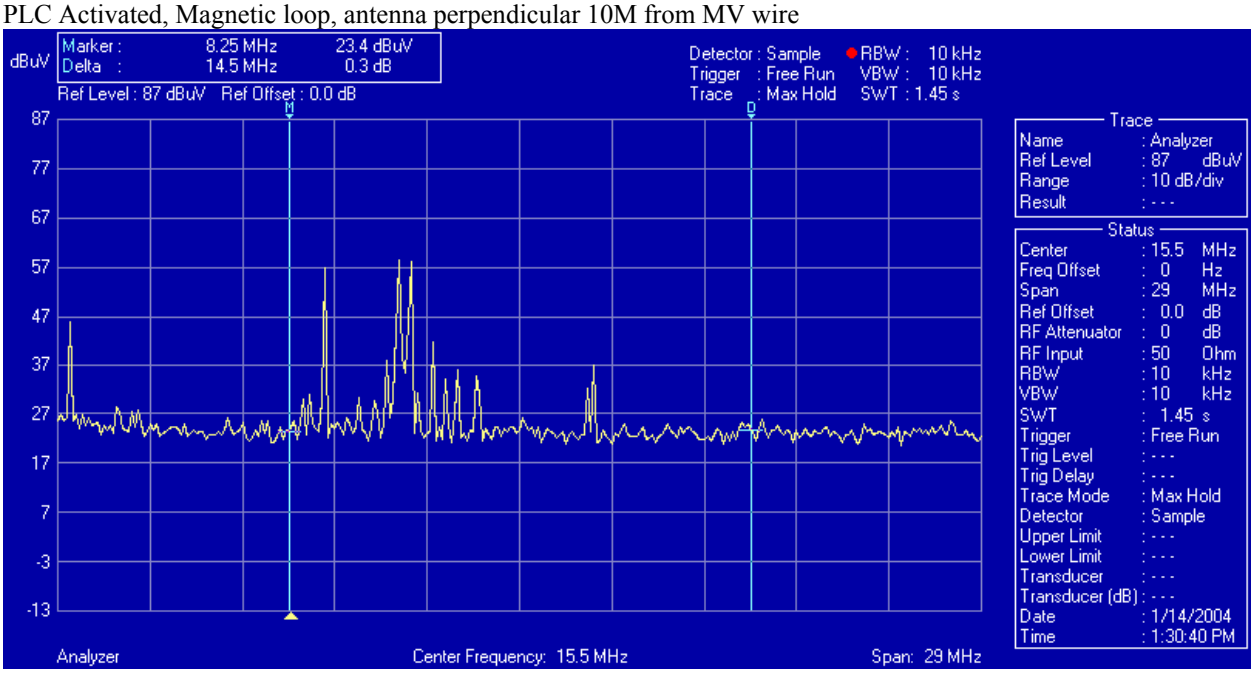
PLC Shutdown, Magnetic loop antenna perpendicular 10M from MV wire



PLC Activated, Magnetic loop antenna parallel 10M from MV wire



PLC Activated, Magnetic loop, antenna perpendicular 10M from MV wire

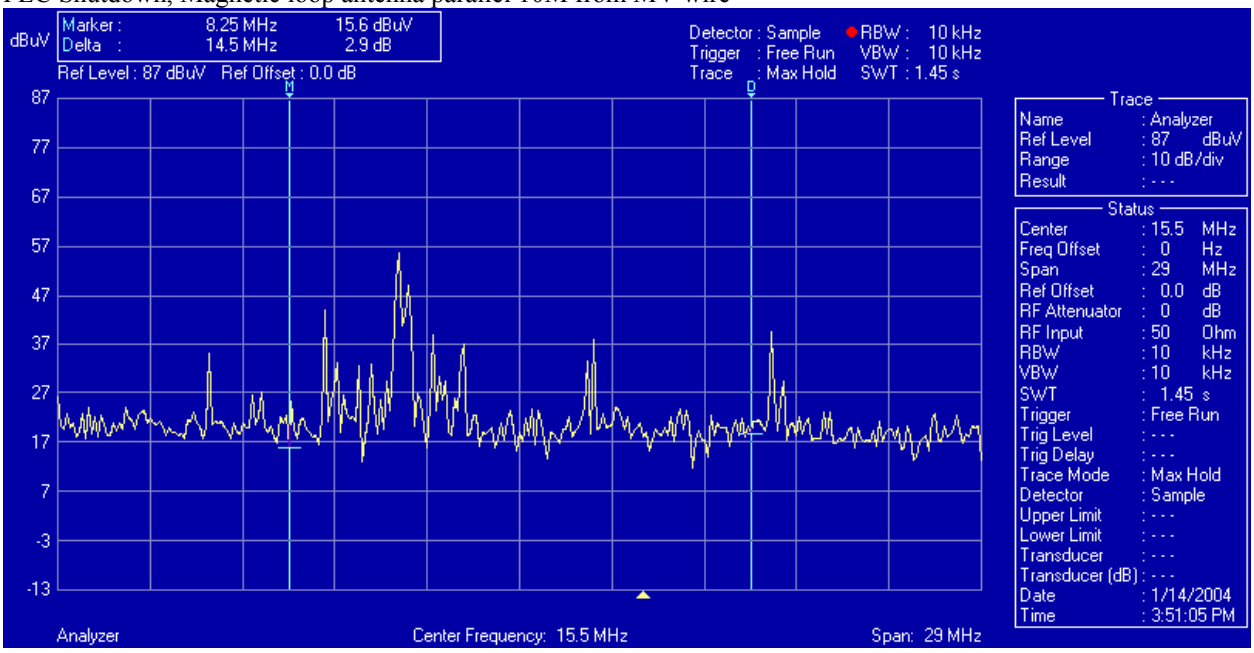


Summary;
Maximum PLC signal amplitude noted (24.75 MHz) 24dBuV + 19.5 (AF)= 43.5 dBuV/M
Limit = 49.5 dBuV/M

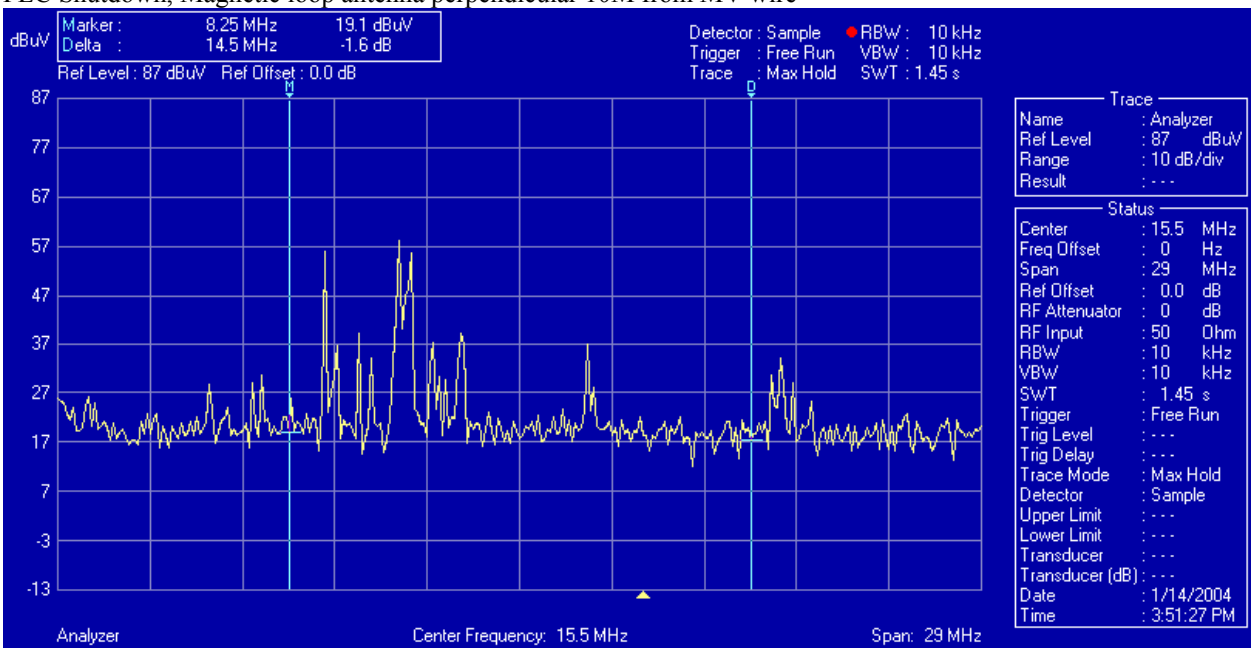
5..□.□.□.□.□.□□□□ Holland Meadows Overhead Deployment

Injector, Upstream (US) center frequency 16.8 MHz, Downstream (DS) center frequency 20.8 MHz

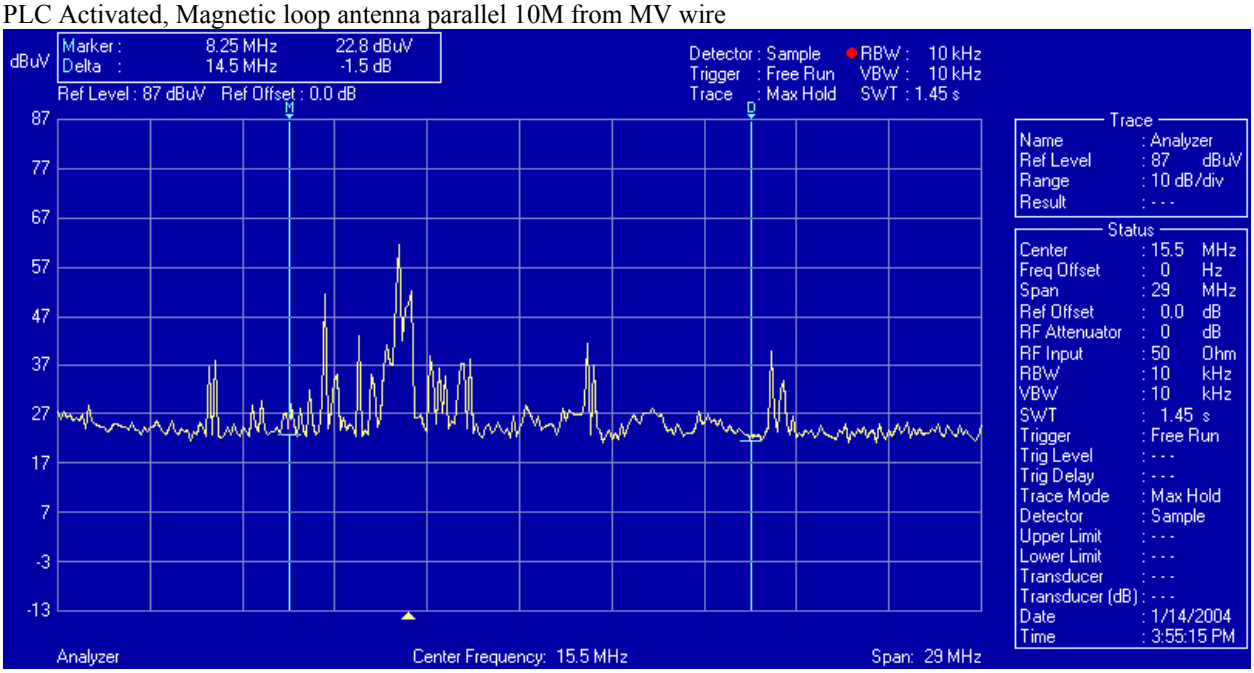
PLC Shutdown, Magnetic loop antenna parallel 10M from MV wire



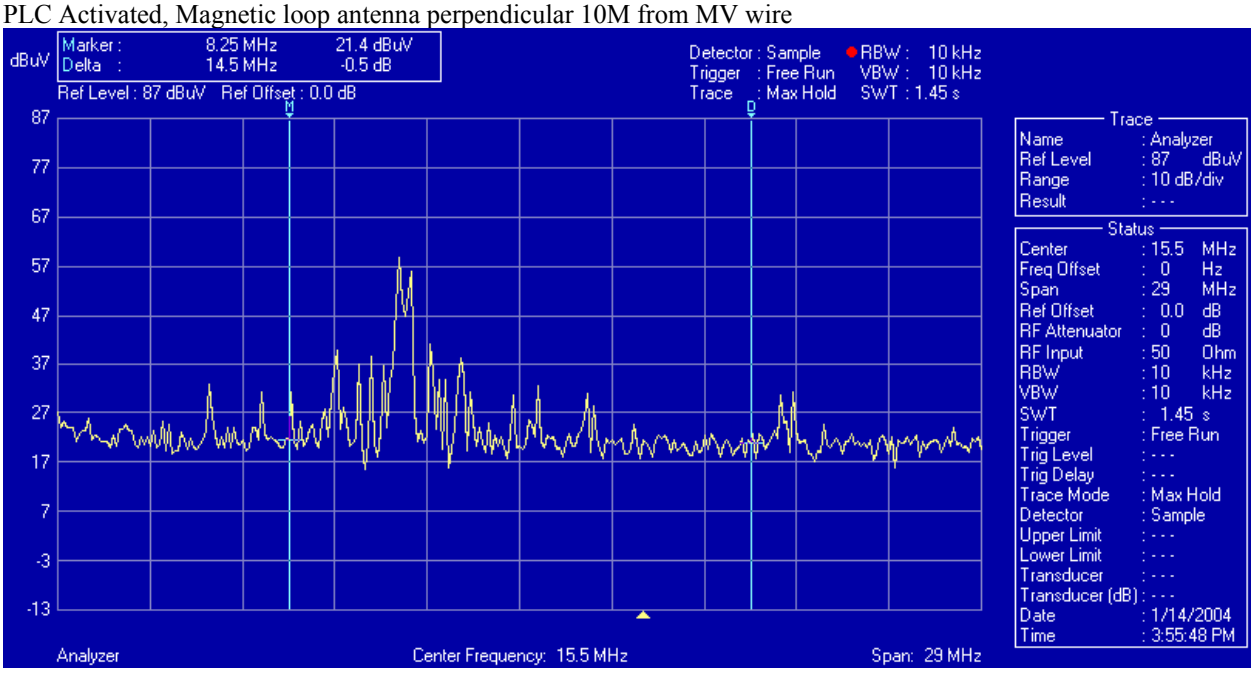
PLC Shutdown, Magnetic loop antenna perpendicular 10M from MV wire



PLC Activated, Magnetic loop antenna parallel 10M from MV wire



PLC Activated, Magnetic loop antenna perpendicular 10M from MV wire

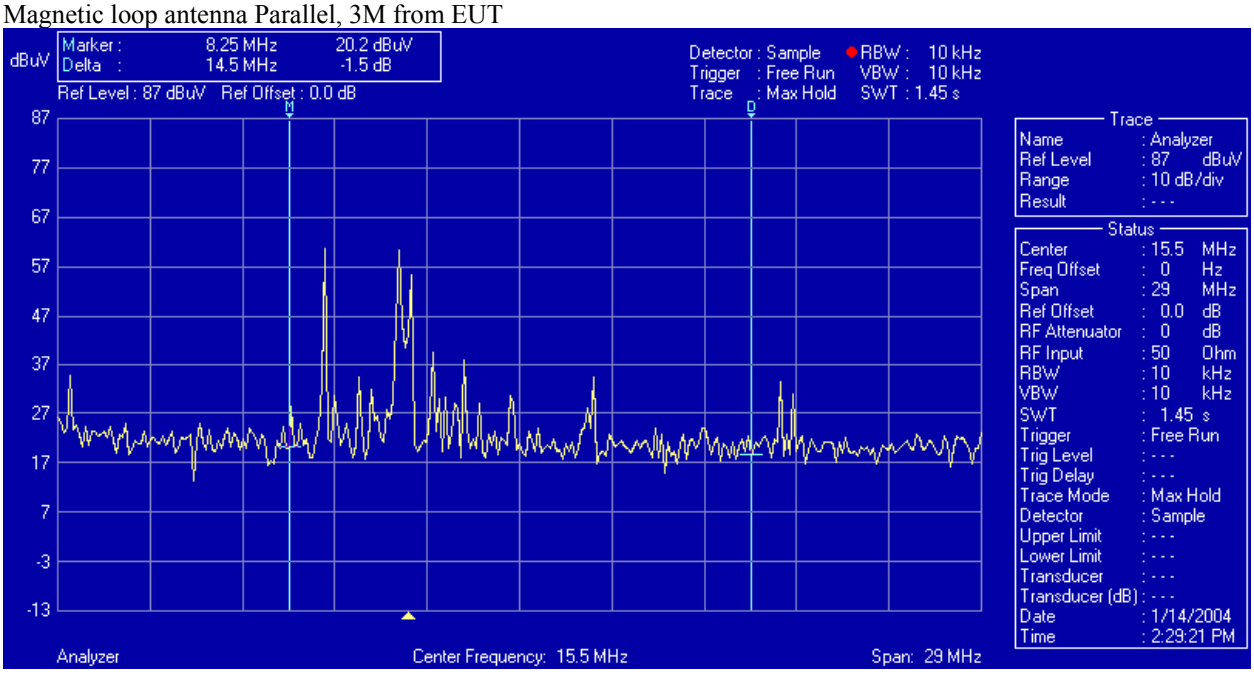


Summary;
Maximum PLC signal amplitude noted (21.5 MHz) 27.2dBuV + 14 (AF)= 41.2 dBuV/M
Limit = 49.5 dBuV/M

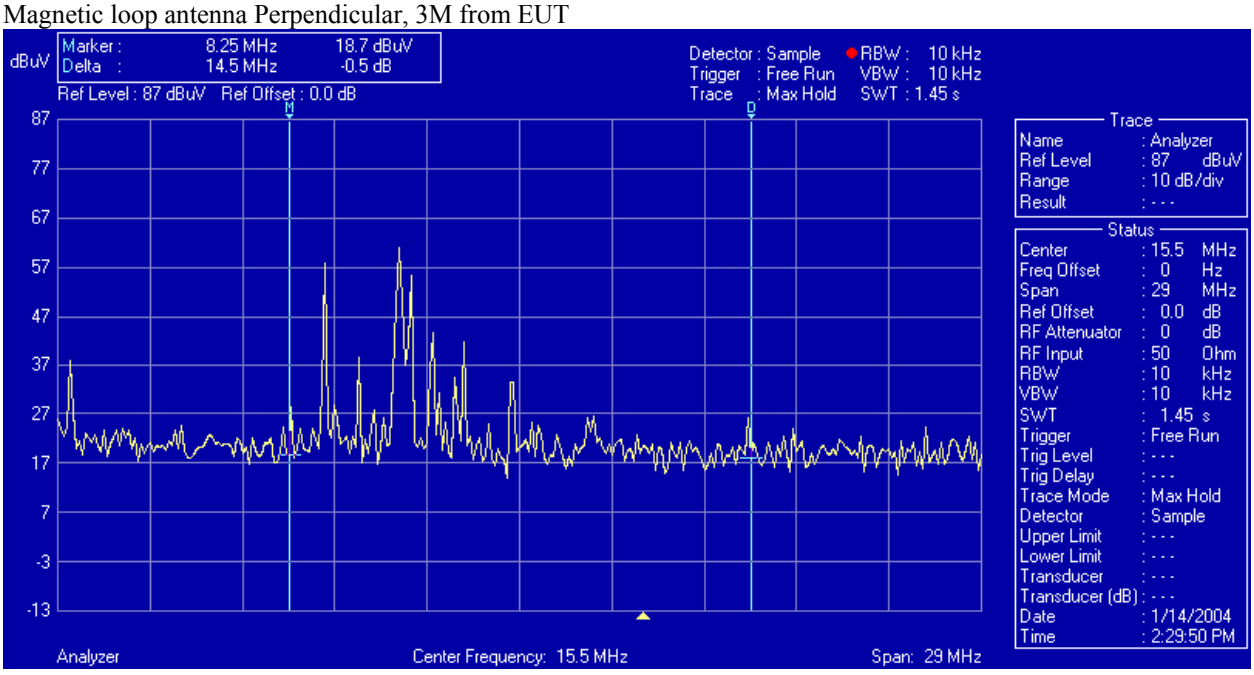
5..□.□.□.□.□.□.□□ Whitehurst Underground Deployment

Injector, Upstream (US) center frequency 21MHz, Downstream (DS) center frequency 26 MHz

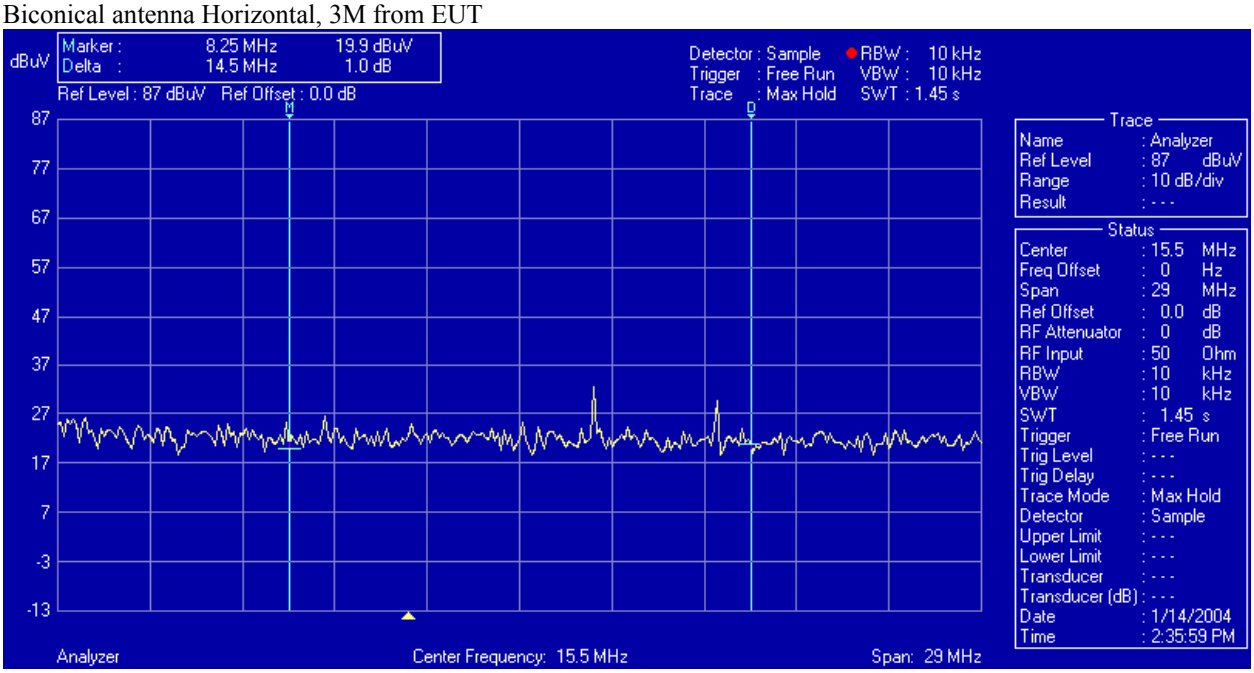
Magnetic loop antenna Parallel, 3M from EUT



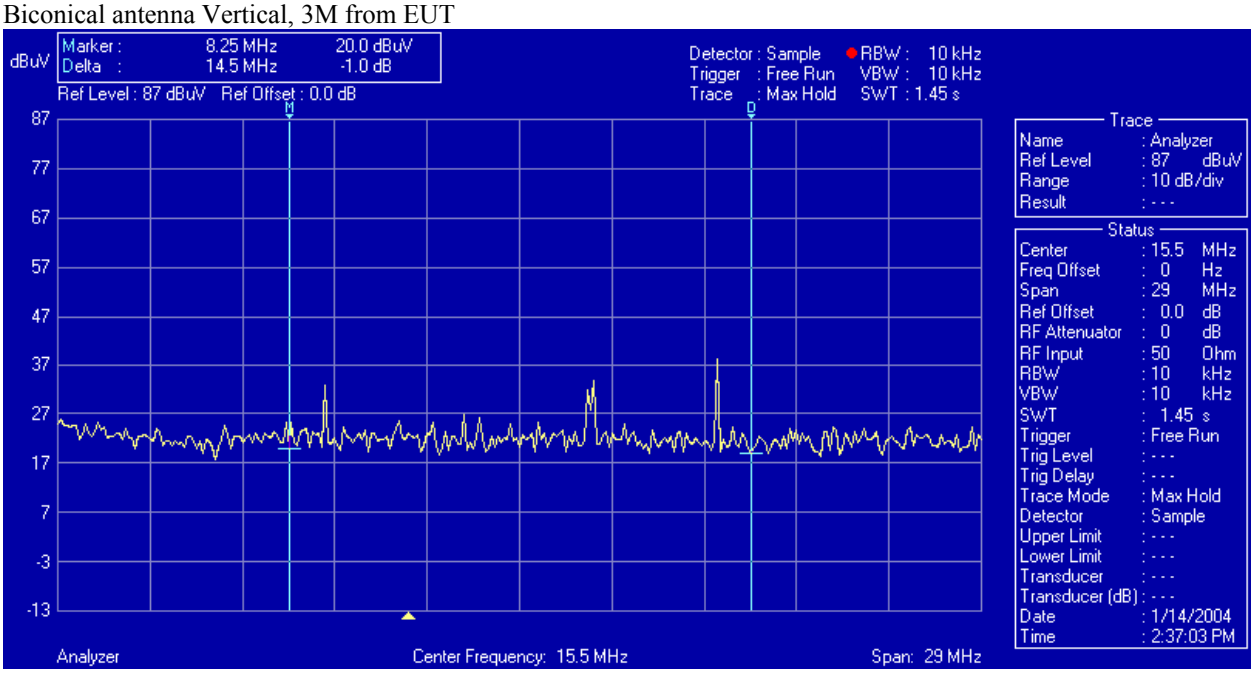
Magnetic loop antenna Perpendicular, 3M from EUT



Biconical antenna Horizontal, 3M from EUT



Biconical antenna Vertical, 3M from EUT



No PLC specific emissions could be identified.

5 Test Operation

Raleigh NC
Normal OFDM operation
Power levels optimized for network performance
William Godwin (Progress Telecom) and Gerrett Durling (Amperion) in attendance.

5 Results Summary

5.1 Pass / Fail Table

Test number	Test Name	Pass/Fail
1	Woodchase Overhead Deployment	Pass
2	Holland Meadows Overhead Deployment	Pass
3	Whitehurst Underground Deployment	Pass

5.2 Exceptions

Not all Installation locations were tested. Locations were selected based on accessibility and are typical of the installation.

5.3

Notes

In the case of all overhead measurements, the antenna was positioned 10M from the Medium Voltage conductor carrying the BPL signal.